

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/19290

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : B01D 53/04, 53/62  
US CL : 95/96,139,900; 423/230; 502/56,103

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 95/96,106,115,118-120,126,139,900; 423/230; 502/34,56,102,103,414

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
NONEElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
NONE**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4,201,751 A (HOLTER et al.) 06 May 1980 (06.05.80).	1-32
A	US 5,091,358 A (BIRBARA et al.) 25 February 1992 (25.02.92).	1-32
A	US 5,186,727 A (CHANG) 16 February 1993 (16.02.93).	1-32
A	US 5,214,019 A (NALETTE et al.) 25 May 1993 (25.05.93).	1-32
A	US 5,980,856 A (OKADA et al.) 09 November 1999 (09.11.99).	1-32
A	US 2001/0001782 A1 (OHASHI et al.) 24 May 2001 (24.05.01).	1-32
A	US 6,280,503 B1 (MAYORGA et al.) 28 August 2001 (28.08.01).	1-32
A,P	US 2003/0047488 A1 (TAKEHIRA et al.) 13 March 2003 (13.03.03).	1-32
A,T	US 6,599,347 B2 (KALBASSI et al.) 29 July 2003 (29.07.03).	1-32

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

## \* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;"

document member of the same patent family

Date of the actual completion of the international search

07 October 2003 (07.10.2003)

Date of mailing of the international search report

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Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Facsimile No. (703)305-3230

Authorized officer

Robert H. Spitzer

Telephone No. 703-308-0661